

REMARKS

STATUS OF CLAIMS

Claims 1-39 are pending.

Claims 3, 7, 11, 16, 20 and 24 and 29 are objected to but are indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 1, 2, 4-6, 8-10, 12-15, 17-19, 21-23, 25-28 and 30-39 are rejected.

By this Amendment, claims 1, 3, 6-7, 10-11, 19-20, 23-24, 34-35 and 38-39 are amended and new claims 40-47 are added. Therefore, claims 1-47 are now presented for consideration.

No new matter is presented by the claim amendments and new claims, accordingly, approval and entry are respectfully requested.

ALLOWABLE SUBJECT MATTER

In the Office Action at page 6, item 7, claims 3, 7, 11, 16, 20, 24 and 29 are indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 3, 16 and 29

Claims 3, 16 and 29 have not been rewritten in independent form since it is submitted that claims 1, 14 and 27 from which claims 3, 16 and 29 depend, patentably distinguish over the cited art and are allowable.

Claims 7, 11 and 20 and 24

Claims 7, 11, 20 and 24 have been suitably rewritten in independent form to render same allowable.

ITEM 2: SUBMISSION OF FORMAL DRAWINGS

In the Office Action at page 3, item 2, the corrections to drawing Figs. 1-3 are approved. Applicant submits herewith 2 sheets of corrected formal drawings (of Figs. 1-3).

Entry is respectfully requested.

ITEM 4: REJECTION OF CLAIMS 1-2, 6, 10, 14-15, 19, 23, 27-28 AND 32-39 UNDER 35 U.S.C. §103(a)

In the Office Action at pages 3-4, item 4, claims 1-2, 6, 10, 14-15, 19, 23, 27, 32-39 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kuwajima et al. (U.S. Patent No. 6,339,422). Although the heading of item 4 does not cite claim 28 as being rejected over Kuwajima et al, the body the rejection of item 4 does cite the rejection of claim 28. Accordingly, Applicants provide, below, an argument to overcome the rejection of claim 28 over Kuwajima et al.

Claims 1-2, 14-15, 27-28, 32-33, 36 and 37

Applicants respectfully traverse the rejection of these claims.

Claim 1

The invention of claim 1 is directed to a driving method for a display apparatus and recites “a frequency of a clock signal, used to drive a display panel, is continuously varied.”

Kuwajima et al. Reference

Kuwajima et al. discloses that:

“[t]he display mode switching register 2 contains a value indicating whether the current display mode is the binary display mode or the gray-scale display mode. The value of the display mode switching register 2 is provided to the variable frequency control circuit 3 and the display circuit 4. The variable frequency control circuit 3 has a function of varying a frequency, and may be a frequency divider, a frequency multiplier (e.g., a PLL circuit), or the like. The variable frequency control circuit 3 sets and outputs a frequency of an operating clock signal to be provided to the display circuit 4 based on the input from the display mode switching register 2.” (See Kuwajima et al. at column 4, lines 49-60.)

Thus, the variable frequency control circuit 3 of Kuwajima et al. sets and outputs an operating clock signal based on one of two modes of operation (i.e., either the binary display mode or the gray-scale display mode). Kuwajima et al. does not disclose or suggest that “a frequency of a clock signal, used to drive a display panel, is continuously varied” (as recited in claim 1). This is because the variable frequency control circuit 3 of Kuwajima et al. is settable at most for each frame in the gray scale display mode. (See Kuwajima et al. at column 1, lines 30-39 which discloses “a frame modulation method” in which “a display data signal on a certain display data signal line is controlled for each ‘frame’ ... to realize a gray-scale display.”) Thus, it

is not possible for the Kuwajima et al. variable frequency control circuit 3 to have “a frequency of a clock signal ... continuously varied.”

It is submitted that claim 1 patentably distinguishes over the cited art for at least the above noted reasons and is allowable.

Claims 14, 27, 36 and 37

It is submitted that claims 14, 27, 36 and 37 patentably distinguish over the cited art for at least reasons similar to those of claim 1, and are allowable.

Claims 2, 15, 28, 32 and 33

Claims 2, 15, 28, 32 and 33, which depend from claims 1, 14 and 27 are submitted to be allowable for at least the same reasons as those of claims 1, 14 and 27, as well as for the additional recitations therein.

Claims 6, 10, 19, 23, 34, 35, 38 and 39

Reconsideration is respectfully requested.

Claim 6

The invention of claim 6 is directed to a driving method for a display apparatus and recites “switching a clock signal ... between at least two frequencies in accordance with time conditions.”

Kuwajima et al. Reference

In Kuwajima et al., an LCD device is driven “with the lowest possible frame frequency [in accordance with display modes] (70 Hz in the binary display mode, and 140 Hz in the 16-level gray-scale display mode)” (brackets added) (see Kuwajima et al. at column 7, lines 3-6), or mode signals thereof. More particularly, in contrast to that of the present invention of claim 6, in Kuwajima et al., the frequency of the operating clock of the LCD device is not switched in accordance with time conditions, but otherwise, is changed in accordance with the mode signals (i.e., according to the set display mode). (See Kuwajima et al. at column 4, lines 56-58.)

Further, in the binary display mode or in the 16-level gray-scale display mode of Kuwajima et al., noise emitted by the display panel is not spread out and a peak value of the noise cannot be reduced, as the frame frequency is fixed in each of the binary display mode or of the 16-level gray-scale display mode. Thus, the frequency of the operating clock of Kuwajima et al. is not switched in accordance with time conditions.

It is submitted that claim 6 patentably distinguishes over the cited art for at least the above noted reasons, and is allowable.

Claims 10, 19, 23, 34, 35, 38 and 39

It is submitted that claims 10, 19, 23, 35, 38 and 39 patentably distinguish over the cited art for at least reasons similar to those of claim 6, and are allowable.

ITEM 5: REJECTION OF CLAIMS 4, 8, 12, 17, 21, 25 AND 30 UNDER 35 U.S.C. §103(a)

In the Office Action at pages 4-5, item 5, claims 4, 8, 12, 17, 21, 25 and 30 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kuwajima et al. as applied to claims 1, 6, 10, 14, 19 and 23, respectively in item 4, and further in view of Admitted Prior Art (in Applicants' Disclosure, page 7, lines 1-8 and Fig. 1)

Reconsideration is respectfully requested.

It is submitted that the admitted prior art in applicants' disclosure does not cure the deficiency of Kuwajima et al., since the admitted prior art discloses only a fixed-frequency clock signal.

Accordingly, it is submitted that claims 4, 8, 12, 17, 21, 25 and 30 patentably distinguish over the cited art for at least the same reasons as those of claims 1, 6, 10, 14, 19, 23 and 27.

ITEM 6: REJECTION OF CLAIMS 5, 9, 13, 18, 22, 26 AND 31 UNDER 35 U.S.C. §103(a)

In the Office Action at page 5, item 6, claims 5, 9, 13, 18, 22, 26 and 31 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kuwajima et al. as applied to claims 1, 6, 10, 14, 19 and 23 respectively in item 4, and further in view of Tanaka et al. (U.S. Patent No. 6,130,420).

Reconsideration is respectfully requested.

It is submitted that Tanaka et al. does not cure the deficiency of Kuwajima et al. This is because Tanaka et al. discloses a similar timing circuit to the circuit of Kuwajima et al. (i.e., which produce a frequency or a divided frequency selected in accordance with an operating mode.) More particularly, a "timing generating circuit 20 [of Tanaka et al.] comprises a reference oscillator 22, a divider 23 and a selector 24... that generates diverse timing signals" (brackets added). (See Tanaka et al. at column 4, line 47-50.) "The divider 23 divides the reference pulses oscillated by the reference oscillator 22 by a factor of m ($1/m$ where m is a natural

number). The selector 24 permits changeover between two choices either the reference pulses as oscillated by the reference oscillator 22, or the divided pulse signal from the divider 23. The switching action is carried out in accordance with the operating mode in effect.” (See Tanaka et al. at column 4, line 60 to column 5, line 1.)

The cited art either taken singularly or in a proper combination neither discloses nor suggests the above-mentioned recitations in independent claims 1, 6, 10, 14, 19, 23 and 27.

Accordingly, it is submitted that claims 5, 9, 13, 18, 22, 26 and 31, which depend from claims 1, 6, 10, 14, 19, 23 and 27, are allowable for at least the same reasons as those of claims 1, 6, 10, 14, 19, 23 and 27, as well as for the additional recitations therein.

NEW CLAIMS 40-47

New claims 40-47 are provide to afford a varying scope of protection.

Claim 40, depends from claim 6 and includes the recitation of “periodically switching the clock signal to reduce the peak noise output of the display panel.” It is submitted that the cited art does not disclose or suggest a time condition to switch the clock signal (i.e., “periodically”). Thus, claim 40 is submitted to patentably distinguish over the cited art for at least the same reasons as those of claim 6, as well as for the additional patentable distinctions therein.

Claims 41-47, which depend from claims 10, 19, 23, 35-36 and 38-39, respectively, are submitted to include recitations similar to that of claim 40 and are submitted to be allowable for reasons similar to those of claim 40.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is respectfully solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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